

PATENT SPECIFICATION

DRAWINGS ATTACHED

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Date of Application and filing Complete Specification: 17 March, 1967.

No. 12648/67.

Application made in Czechoslovakia (No. 2000) on 25 March, 1966.

Complete Specification Published: 13 Aug., 1969.

Index at acceptance: —A5 R(85D3, 85F1)

International Classification: —A 61 n 1/36

COMPLETE SPECIFICATION

Improvements in or relating to Cardiac Stimulators

5 We, CHIRANA, ZAVODY ZDRAVOTNICKÉJ
TECHNIKY, ODBOROVY PODNIK, a Czechoslovakian Body Corporate of Stara Tura,
Czechoslovakia, do hereby declare the invention,
for which we pray that a patent may
be granted to us, and the method by which
it is to be performed, to be particularly described
in and by the following statement:—

10 This invention relates to a cardiac stimulator
for implantation in the human body,
and having an electrode forming part of the
surface of the apparatus for connection with
one of the terminals of a pulse generating
means.

15 The cardiac stimulator is a generator of
electrical pulses used for the control of the
heart function during heavy anomalies of
the heart rhythm. This very small generator
with batteries is provided within an envelope
20 made of material compatible with the environment
of the human body to permit its implantation
and permanent location therein. A first output
terminal of the pulse generator, the stimulating
terminal, is connected by an
25 electrical conductor to a first electrode implemented
in the myocardium. A second output terminal
of said pulse generator is connected in the
unipolar stimulation method, to the tissue of
the front abdominal wall
30 near the implanted apparatus by a second
electrode. For effecting this latter connection
the present cardiac stimulators use a conductor
several centimetres in length which is connected
by one end to the apparatus and the other end
35 is stitched to human tissue. With this arrangement
breaking-off from the apparatus, and interruption
and disconnection from the human tissue occurs.
According to another arrangement the connection
of the conductor or leads with the tissue is
40 effected in that the second electrode forms a
part of the surface of the apparatus and dur-

ing the implantation period permanently
contacts the tissue. Such a second electrode used
to take the form of a wire loop located on
the apparatus periphery. With such an
arrangement provided with a small electrode
surface of less than 1 square centimetre, a
considerable current density appears at the
electrode-tissue junction.

50 For this reason undesirable tissue stimulation
can be evoked near the location of the
apparatus in the human body. The electrode
of other known apparatus used to be designed
in the form of a plane metal plate located on
the surface of the apparatus. Long term
reliable conductive connection is not obtained
with this type of apparatus because of the
flesh envelope formed by the organism
55 around the implanted apparatus.

60 According to the invention there is provided
a cardiac stimulator for implantation into
the human body having a first electrode for
fixing to the myocardium and a second
electrode forming an integral part of the
65 side wall and of the bottom of the stimulator,
this second electrode having the shape of a
tape and being located such as to pass from
the side wall to the bottom over one common
edge formed by said side wall and the
70 bottom of the stimulator.

75 In our copending British Patent Application
No. 12647/67 (Serial No. 1,161,578) we describe
and claim a cardiac stimulator for implantation
in the human body, wherein a channel receiving
an electrical conductor opens into a recess in
the envelope of the stimulator, whereby the
conductor can be looped about the envelope
without forming a sharp bend.

80 An embodiment of a cardiac stimulator in
accordance with the invention will be now
described by way of example with reference
to the accompanying drawing, wherein:

[Price

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Figure 1 shows the front view of the cardiac stimulator and

Figure 2 a view from below of said cardiac stimulator.

- 5 The cardiac stimulator consists of an apparatus contained in an envelope 1 made of material compatible with the environment of the human body to permit its implantation therein, said apparatus comprising first and
10 second electrodes, said second electrode 2 located according to the drawing and forming a part of the apparatus. Said second electrode 2 passes on the bottom part of the cardiac stimulator over the edge into the
15 bottom of the envelope 1. The screws 4 secure the fixation of the electrical conductor (not illustrated) of the first or stimulation electrode in the channel 5. The second electrode 2 is elongate with a width of 15 mm,
20 which forms a part of the flat side wall of the envelope and passes over its bottom edge. The total surface of this electrode is preferably at least 5 square centimetres.

- 25 This embodiment of the invention obtains on the one hand a reliable connection of the second electrode 2, by passing the electrode over the edge of the stimulator to connect, with the human tissue, and on the other hand has with regard to its elongate form a low

current density which is less than the stimulation threshold of human tissue. 30

Mechanical failure, for example the break-off of the electrical conductor which, in known stimulators, connects the second electrode with the tissue, is eliminated by this design. 35

WHAT WE CLAIM IS:—

1. A cardiac stimulator for implantation into the human body having a first electrode for fixing to the myocardium and a second electrode forming an integral part of the side wall and of the bottom of the stimulator, this second electrode having the shape of a tape and being located such as to pass from the side wall to the bottom over one common edge formed by said side wall and the bottom of the stimulator. 40

2. A cardiac stimulator substantially as hereinbefore described with reference to and as illustrated in the accompanying drawing. 45 50

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Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1969.

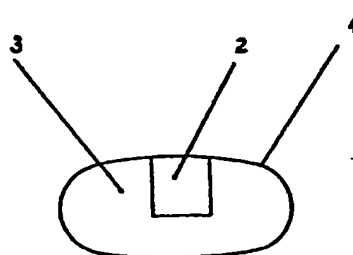
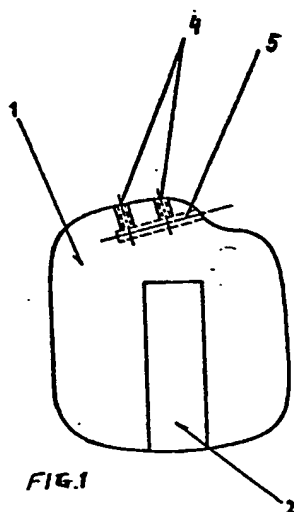
Published by the Patent Office, 25, Southampton Buildings, London, W.C.2. from which copies may be obtained.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*



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